

LNCT UNIVERSITY, BHOPAL

Programme:- BCA

Semester – VI

wef: July 2022

Name of Paper	Paper Code	Theory					
		Credit			Marks		
Cloud Computing Basics	BCA-601	L	T	J	EST	CAT	Total
		3	1	0	70	30	100
Course Objective	The objective of this course is to provide students with the fundamentals and essentials of Cloud Computing. Also to provide students a sound foundation of the Cloud computing so that they are able to start using and adopting Cloud Computing services and tools in their real life scenarios.						
Units	Contents (Theory)						Hours /week
I	Cloud Computing Overview: Origins of Cloud computing, Cloud components, Essential characteristics, On-demand service, Broad network access, Location independent resource pooling, Rapid elasticity, measured service.						8
II	Cloud scenarios, Benefits: scalability, simplicity, vendor security, Limitations, Sensitive information, Application development, Security concerns, privacy concern with a third party, security level of third party, security benefits, Regularity issues and Government policies.						8
III	Cloud architecture: traditional IT Model Software as a Service (SaaS) : SaaS service providers, Google App Engine, Salesforce.com and Google platform, Operational benefits, Economic benefits, Evaluating SaaS Platform as a Service (PaaS), PaaS service providers, Right Scale, Salesforce.com, RackspaceForce.com, Services and Benefits.						8
IV	Infrastructure as a Service (IaaS): IaaS service providers - Amazon EC2, GoGrid Microsoft, implementation and support, Amazon EC service, level agreement, Recent developments Benefits, Cloud deployment model: Public clouds, Private clouds, Community clouds, Hybrid clouds, Advantages of Cloud computing.						8
V	Virtualization: Virtualization and cloud computing, Need of virtualization, cost & administration, Types of hardware virtualization, Full virtualization, partial virtualization, Para-virtualization, Desktop virtualization, Software virtualization, Memory virtualization, Storage virtualization, Data virtualization, Network virtualization, Microsoft Hypervisor, VMware features and infrastructure, Virtual Box.						8

LNCT UNIVERSITY, BHOPAL

Programme:- BCA

Semester – VI

wef: July 2022

Text Books/ References Book:-			
Name of Authors	Titles of the Book	Edition	Name of the Publisher
Anthony T.Velte, Toby J.	Cloud computing a practical approach	2010	TATA McGraw- Hill, New Delhi
Michael Miller	Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate	2008	Que Publishing
Buyya, Selvi	” Mastering Cloud Computing “		TMH Pub
Kumar Saurabh	“Cloud Computing”		Wiley Pub
COURSE OUTCOMES: Students will be able to			
CO 1	Explain the core concepts of the cloud computing paradigm.		
CO2	Analyze various cloud programming models and apply them to solve problems on the cloud.		
CO3	Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing		
CO4	Establishes and maintains all other components of the technology stack.		
CO5	Expedite updates, improve software security, and maintain an efficient pipeline between development, testing, and deployment.		

LNCT UNIVERSITY, BHOPAL

Programme:- BCA

Semester – VI

wef: July 2022

Name of Paper	Paper Code	Theory					
		Credit			Marks		
Software Testing	BCA-602 E-II (1)	L	T	J	EST	CAT	Total
		3	1	0	70	30	100

Course Objective	The objective is to find any defects or bugs that may have been created when the software was being developed, prevent defects in the final product, to ensure the end product meets customer requirements as well as the company specifications.
-------------------------	---

Units	Contents (Theory)	Hours /week
I	Introduction: Software Testing Process ,Objective, Testing Techniques, Software Testing Life Cycle, Concept of Testing ,Types of Errors, Stubs and Drivers, Verification and Validation, Different types of Verification & Validations Mechanisms.	8
II	Software Testing Methods: Testing Fundamentals Test Case Design White Box Testing and its Types, Black Box Testing and its Types, Software Testing Strategies- unit Testing, Integration Testing, Validation Testing, System Testing. Test Planning Budgeting and Scheduling.	8
III	Software Test Automation: Define Software Test Automation, Skills needed for Automation, Scope of Automation, Design and Architecture for Automation, Requirements for a Test Tool, Challenges in Automation Tracking the Bug, Debugging.	8
IV	Software Testing Metrics: Concept and Developing Testing Metrics Different Types of Metrics Complexity Metrics Defect Management Definition of Defects Defect Management Process Defect Reporting Metrics Related to Defects Using Defects for Process Improvement.	8
V	Fundamentals of software quality assurance: SQA basics, Components of the Software Quality Assurance System, software quality in business context, planning for software quality assurance, product quality and process quality.	8

LNCT UNIVERSITY, BHOPAL

Programme:- BCA

Semester – VI

wef: July 2022

Text Books/ References Book:-			
Name of Authors	Titles of the Book	Edition	Name of the Publisher
Burnstein, I.	Practical Software Testing	2003	Springer-Verlag
Crispin, L. & Gregory, J.	Agile Testing: A Practical Guide for Testers and Agile Teams	2009	Addison-Wesley
Kshirasagar Naik & Priyadarshi Tripathy	Software Testing and Quality Assurance: Theory and Practice	1 st edition 2008	Wiley Publication
Srinivasan Desikan & Gopaldaswamy Ramesh	Software Testing: Principles and Practices	1 st edition 2005	Pearson Education
COURSE OUTCOMES: Students will be able to			
CO1	Understand Roles and Responsibilities of Business Analyst, Developers, Architects, Testing Team (Lead, Manager), Manual and Automation Testers, Project Managers, Configuration Management team, end users, clients and others.		
CO2	Integrate software quality assurance practices using Testing Maturity Model (TMM) levels for software development processes.		
CO3	Analyze test cases to support multiple testing goals.		
CO4	Develop a comprehensive software quality and test automation strategy by selecting two or more automated test tools.		
CO5	Determine the costs associated with producing and maintaining quality products.		

LNCT UNIVERSITY, BHOPAL

Programme:- BCA

Semester – VI

wef: July 2022

Name of Paper	Paper Code	Theory					
		Credit			Marks		
Compiler Design	BCA-602 E-II (2)	L	T	J	EST	CAT	Total
		3	1	0	70	30	100
Course Objective	The aim of this course is to provide students with the knowledge and abilities to design and implement compilers.						
Units	Contents (<i>Theory</i>)						Hours /week
I	Introduction of Compiler: Major Data Structure in Compiler, Types of Compiler, Front-end and Back-end of Compiler, Compiler Structure: Analysis-Synthesis Model of Compilation, Various Phases of a Compiler, Lexical Analysis: Input Buffering , Specification & Recognition of Tokens, Design of a Lexical Analyzer Generator, LEX.						8
II	Syntax analysis: CFGs, Top down parsing, Brute force approach, recursive descent parsing, transformation on the grammars, predictive parsing, bottom up parsing, operator precedence parsing, LR parsers (SLR,LALR, LR), Parser generation. Syntax directed definitions: Construction of Syntax trees.						8
III	Type checking: type system, specification of simple type checker, equivalence of expression, types, type conversion, overloading of functions and operations, polymorphic functions. Run time Environment: storage organization, Storage allocation strategies, parameter passing, dynamic storage allocation, Symbol table, Error Detection & Recovery						8
IV	Intermediate code generation: Declarations, Assignment statements, Boolean expressions, Case statements, Back patching, Procedure calls Code Generation: Issues in the design of code generator, Basic block and flow graphs, Register allocation and assignment, DAG representation of basic blocks, peephole optimization, generating code from DAG.						8
V	Introduction to Code optimization: sources of optimization of basic blocks, loops in flow graphs, dead code elimination, loop optimization, Introduction to global data flow analysis, Code Improving transformations, Data flow analysis of structure flow graph						8

LNCT UNIVERSITY, BHOPAL

Programme:- BCA

Semester – VI

wef: July 2022

	Symbolic debugging of optimized code.		
Text Books/ References Book:-			
Name of Authors	Titles of the Book	Edition	Name of the Publisher
A. V. Aho, R. Sethi, and J. D. Ullman.	Compilers: Principles, Techniques and Tools	2001	Pearson Education
V Raghavan	Principles of compiler design	2012	TMH Pub
Kenneth C. Louden	Compiler Construction: Principles and Practice,	1 st edition	PWS Publishing.
A. C. Holub..	Compiler Design in C	1993	Prentice-Hall Inc
Andrew W. Appel	Modern Compiler Implementation C	2004	Cambridge University Press, UK.
COURSE OUTCOMES: Students will be able to			
CO1	Translate a formal language to another formal language and break syntaxes into a series of tokens, by removing whitespace in the source code.		
CO2	Understand the parser and its types i.e. Top-Down and Bottom-up parsers and construction of LL, SLR, CLR, and LALR parsing table. Analyzed source program with respect to its correctness, the correctness of the lexicon, syntax and semantics.		
CO3	Acquire knowledge about run time data structure like symbol table organization and different techniques used in that.		
CO4	Implement the compiler using syntax-directed translation method and get knowledge about the synthesized and inherited attributes.		
CO 5	Understand the target machine's run time environment, its instruction set for code generation and techniques used for code optimization.		

LNCT UNIVERSITY, BHOPAL

Programme:- BCA

Semester – VI

wef: July 2022

Name of Paper	Paper Code	Theory					
		Credit			Marks		
Natural Language Processing	BCA-602 E-II (3)	L	T	J	EST	CAT	Total
				3	1	0	70
Course Objective	The objective of this course is to teach students the basic concepts of neural networks, neurons, and deep learning and to get acquainted with the algorithmic description of the main language levels that includes morphology, syntax, semantics, and pragmatics for information retrieval and machine translation applications.						
Units	Contents (<i>Theory</i>)						Hours /week
I	Introduction To NLP : Introduction to various levels of natural language processing, Ambiguities and computational challenges in processing various natural languages. Introduction to Real life applications of NLP such as spell and grammar checkers, information extraction, question answering, and machine translation.						8
II	Text Processing and Morphology: Character Encoding, Word Segmentation, Sentence Segmentation, Introduction to Corpora, Corpora Analysis. Inflectional and Derivation Morphology, Morphological Analysis and Generation using finite state transducers.						8
III	Lexical Syntax and Language Modeling: Introduction to word types, POS Tagging, Maximum Entropy Models for POS tagging, Multiword Expressions, The role of language models. Simple N-gram models. Estimating parameters and smoothing, Evaluating language models.						8
IV	Syntax & Semantics: Introduction to phrases, clauses and sentence structure, Shallow Parsing and Chunking, Shallow Parsing with Conditional Random Fields (CRF), Lexical Semantics, Word Sense Disambiguation, WordNet, Thematic Roles, Semantic Role Labelling with CRFs.						8
V	Applications Of NLP: NLP Interfaces, Text Summarization, Sentiment Analysis, Machine Translation, Question answering, Recent Trends in NLP						8

LNCT UNIVERSITY, BHOPAL

Programme:- BCA

Semester – VI

wef: July 2022

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Daniel Jurafsky and James H. Martin	Speech and Language Processing	3rd Edition 2009	Prentice Hall
Chris Manning and Hinrich Schütze,	Foundations of Statistical Natural Language Processing	2nd Edition 2003	MIT Press Cambridge, MA
Nitin Indurkha, Fred J. Damerau	Handbook of Natural Language Processing	2nd Edition 2010	CRC Press
James Allen	Natural Language Understanding	8th Edition. 2012	Pearson Publication
COURSE OUTCOMES: Students will be able to			
CO1	Understand the principles and Process the Human Languages Such as English and other Indian Languages using computers.		
CO2	Creating CORPUS linguistics based on digestive approach (Text Corpus method). Demonstrate understanding of state-of-the-art algorithms and techniques for text-based processing of natural language with respect to morphology.		
CO3	Perform POS tagging for a given natural language. Select a suitable language modeling technique based on the structure of the language.		
CO4	Check the syntactic and semantic correctness of sentences using grammars and labeling.		
CO5	Develop Computational Methods for Real World Applications and explore deep learning based NLP.		

LNCT UNIVERSITY, BHOPAL

Programme:- BCA

Semester – VI

wef: July 2022

Name of Paper	Paper Code	Practical				
		Credit		Marks		
Programming Lab in Cloud Computing	BCA-603	P	J	ESP	CAP	Total
		6	-	70	30	100

Contents (Practical) :-

1. Installation and configuration of Hadoop/Euceliptus etc.
2. Service deployment & Usage over cloud.
3. Management of cloud resources.
4. Using existing cloud characteristics & Service models .
5. Cloud Security Management.
6. Performance evaluation of services over cloud .
7. Write a program for web feed.
8. Study and implementation of Single-Sign-On.
9. User management in cloud.
10. Case study on Amazon EC2/ Microsoft Azure/ Google Cloud Platform.

LNCT UNIVERSITY, BHOPAL

Programme:- BCA

Semester – VI

wef: July 2022

Name of Paper	Paper Code	Practical				
		Credit		Marks		
Major Project	BCA-604	P	J	ESP	CAP	Total
		-	8	120	80	200

Contents (Practical)

Process: - Project Guide of the project will be allotted by Director/Head of Department. Any related technology can be chosen for development of Project. It is to be done in Industry/Organisation.